To: 'Tony Donigian'[Tony.Donigian@respec.com]; 'SPaul (SPaul@mbakerintl.com)'[SPaul@mbakerintl.com]
Cc: 'Anurag Mishra'[Anurag.Mishra@respec.com]
From: Shaikh, Taimur
Sent: Thur 3/22/2018 9:27:41 PM
Subject: RE: IRW TMDL report .... TMDL calcs section

Hi Tony,
Sounds good.
Thanks.
Taim.

Taimur A. Shaikh, Ph.D.
Assessment, Listing, and TMDL Section (6WQ-PT)
Water Division | EPA Region 6

From: Tony Donigian [mailto:Tony.Donigian@respec.com]
Sent: Thursday, March 22, 2018 2:17 PM
To: Shaikh, Taimur ; SPaul (SPaul@mbakerintl.com)
Cc: Anurag Mishra
Subject: IRW TMDL report .... TMDL calcs section

Guys –
Below is a part of Section 5 on the TMDL calcs. Please review and send any edits or questions. I just want to put down what we did, and hope you all agree, or can make some edits to improve it.
Taim – You will need to add/expand the rationale for using the average annual loads to get the TMDL.
I'll put in some text for the sections on Critical Conditions and Seasonal Variability discussing how the model handles these situations, but it won't be consistent with the use of the annual load. Any thoughts?
Thanks,
Tony

The procedures for calculating the TMDL were as follows:

1. The Baseline model was run for an 18-year period from 1992 to 2009, to identify the 30-day geomean TP concentrations that needed to be reduced to meet the 0.037 mg/l TP OK Scenic Rivers water quality standard.

2. Subsequently, numerous model scenarios were executed with global (i.e. state-wide) reductions applied to both point and nonpoint sources in order to identify the general level of reduction needed to meet the 0.037 mg/l TP standard as the 30-day geomean concentration. The scenarios were checked to determine whether or not the standard was met at both the AR/OK stateline (reach 630) and numerous mainstem sites on the Illinois River down to the final stream reach (Reach 890) into Tenkiller Ferry Lake.

3. From Step 2, the scenario with a 69% reduction in all sources for AR, and a 93% reduction for OK, produced compliance with the 0.037 mg/l TP standard at all sites leading into Tenkiller Ferry Lake. The daily loads calculated for this scenario at Reach 630 were 33.9 lb/day TP, and at Reach 870, the daily load was 3,303 lb/day TP. It should be noted that the compliance time period (period when the standard is just met) occurred during the 2005-06 dry period (i.e., December 2005) for the Stateline site, whereas the corresponding time period for the downstream site (Reach 870) occurred in May 1999 during moderate-to-high spring flows.

4. Mean annual loads were then generated for the 69% AR and 93% OK reduction scenario, and the 18-year mean annual load was divided by 365.25 to determine the average daily load at all sites of interest. This produced a TMDL of 291.5 lb/day TP at Reach 630 and 378 lb/day TP at Reach 870.

5. These daily value were then distributed into the TMDL components as follows:

    a. The annual load allocation provided the WLA component.

    b. The LA was determined by difference, i.e., LA = TMDL – WLA – FG, where FG was estimated as 0.1% of the TMDL.

6. The same calculations were performed at each of the terminal pour points for the impaired waterbodies in OK, as defined on the 2012 303d list.

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